THE LOST WAX PROCESS OF CASTING

THE lost wax process of casting, used in the sixteenth century by artists, has today found a place in the manufacture of precision castings. The new version of the process makes it possible to do casting with such precision that no further machining is necessary.

The process as used today utilizes improved molding materials and casting devices. First a metal master pattern of the part to be cast is made, with allowance for shrinkage of the cast metal. This is used to cast a split lead alloy mold which is provided with dowel pins for accurate mating.

Next the lead mold, clamped together, is placed in a wax injection machine. There is a partial vacuum around the mold, and the melted wax is forced into the cavity under pressure so that it reaches all parts of the mold. When the wax has hardened, the mold is removed and opened. Several wax patterns made in this way can be joined by heating the points of contact, and more complicated pieces made.

The wax pattern is then dipped into a suspension of fine silica flour in a liquid binder. When this has hardened, the silica painted pattern is placed in a metal container and the mold material, of graded silica sands with a binder, is poured in. When the sand has set, the wax is melted out and the molds are heated to make them ready for the casting operation. The molten metal may be introduced by compressed air or by centifugal force. After casting, the molds are allowed to cool, after which they are broken open to remove the casting.

Fine detail is maintained in the cast parts by

(Continued on page 36)

O W I Photo by Palmer, in an Allegheny Ludlum Plant

Final Examination

BEFORE STAINLESS GETS ITS WINGS

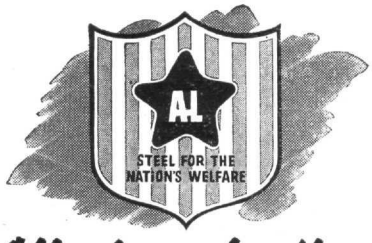
REDUCE ACCIDENTS!

In 1941, accidents were first cause of death among men from 22 to 38 years of age. The productive man-days lost were enough to build twice as many battleships as now possessed by the combined Allied Navies.

These are losses that *can* be avoided. Don't take unnecessary risks at any time; and later, when you enter business life, remember that carelessness is the single greatest factor in human and economic loss.

A GREAT deal of costly processing is done on stainless steel, to secure the physical characteristics and surface finish required for the particular war job it is to perform. But one day all the rolling, heat treating and surface finishing is completed, and bright sheets of Allegheny Metal lie ready for final inspection and shipment to the war plants.

They're *right*, those sheets—flawless of surface and true to specifications. They'll do their job and more—which is what everything and everybody *must* do, in a war like this. In the case of stainless steel, that job is the supplying of vastly increased strength with equal or decreased weight, and high resistance to heat and corrosion. These are qualities of great value now, and of even greater promise for the future.



Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

W&D A-9319

LOST WAX PROCESS

(Continued from page 26)

the use of mold materials which will pass through three hundred mesh screen. Depending somewhat on the metal or alloy being used, the tolerances of the cast part can be held within .002 to .005 inches per linear inch of casting.

The process is of value in producing parts which otherwise would require entensive machining, or which are made of metals that are unmachinable. Of first importance, however, is the fact that small intricate parts which could be made no other way can be produced in quantity by precision casting.

Because the process has been developed and made applicable to alloys of high melting point, which retain their strength and hardness at high temperature, it has proven particularly suitable for making buckets of the gas turbine which drives the turbosuperchargers of bombing planes. These turbines are propelled by the exhaust gas from the engines and operate at red heat.